

**RUNWAY 5/23 SAFETY AREA IMPROVEMENTS**

**LAURENCE G. HANSCOM FIELD  
BEDFORD, MASSACHUSETTS**

**SUPPLEMENTAL DOCUMENTATION**

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## **1.0 PROJECT DESCRIPTION**

This section describes the need for the project; describes Hanscom Field in general and the project site in particular; presents the alternatives analysis which led to the selection of the proposed improvements; and describes the proposed improvements in detail. The project-related resource impacts, mitigation measures and regulatory compliance are described in the ENF and in Section 2.0 below.

### **1.1 BACKGROUND AND NEED FOR PROJECT**

A runway safety area (RSA) is a defined surface surrounding the runway and is prepared or suitable for reducing the risk of damage to aircraft in the event of an undershoot (aircraft landing short of the runway), an overshoot (aircraft landing on the runway but not able to stop on the runway), or an excursion from the runway (aircraft moving off the runway to the right or left). A RSA also provides access to fire fighting and rescue equipment during such incidents. The Federal Aviation Administration (FAA) has established a Runway Safety Area Program (FAA Order 5200.8) to ensure that federally obligated Part 139 airports have runway safety areas which are compliant to the extent possible with FAA standards. The required physical dimensions of RSAs are defined in an Advisory Circular (150/5300-13, Airport Design), as described in more detail in Section 1.2 below.

In 2000 and 2001, Massport reconstructed Runway 5/23 at Hanscom Field. Because the runway safety areas did not meet Federal Aviation Administration (FAA) standards, the FAA issued an exemption to Massport allowing the safety areas to remain unimproved during the runway reconstruction. The exemption also required Massport to improve the existing Runway 5/23 safety areas in order to bring them closer to compliance with FAA standards. Specifically, FAA required Massport to revise its Runway 5/23 runway safety area alternatives study and to implement the recommended alternative. The study, the *Runway 5-23 Safety Area Supplementary Feasibility Analysis*, was completed in 2001. (The alternatives analysis is summarized below in Section 1.5.) In a letter dated 29 March 2002 (attached as Appendix D), the FAA accepted the improvements recommended in the *Feasibility Analysis*.

The proposed improvements for the Runway 5/23 safety areas at Hanscom Field are intended to enhance the safety of airport users. The improvements will not have any effect on normal runway operations, and there will be no runway expansion, no additional pavement, and no increase in capacity. Runway capacity can be increased by either lengthening the runway or improving the navigational aids that service the runway, and this project will not change the existing runway length or navigational aids.

## **1.2 FAA DESIGN REQUIREMENTS**

FAA Advisory Circular 150/5300-13 defines the size and shape of the RSA, the longitudinal and transverse grading requirements, and objects that may or may not be allowed within the RSA. The dimensions of the RSA as specified in the design standards depend on the airport's airplane design group, which is C-III for Hanscom Field. The RSA dimensions for the C-III design group are 500 feet wide by 1,000 feet long. The grading requirements are as follows:

- Longitudinal grades (along extended centerline of runway):
  - First 200 feet – 0% to -3%.
  - Beyond 200 feet – 5% maximum negative slope or a positive slope such that no part of the safety area penetrates the approach surface or clearway.
  - Maximum grade change is plus or minus 2% per 100 feet, and parabolic vertical curves must be used.
- Transverse grades (perpendicular to the extended runway centerline):
  - First 200 feet – -1% to -1.5% for paved blast pads or overruns, -1.5% to -3.0% for turf.
  - Beyond 200 feet – plus or minus 5%.

The FAA standards states that RSAs shall be:

- Cleared and graded to have no potentially hazardous ruts, humps, depressions or other surface variations;
- Drained by grading or storm sewers to prevent water accumulation;
- Capable under dry conditions of supporting snow removal equipment, aircraft rescue and fire fighting equipment, and the occasional passage of aircraft without causing structural damage to the aircraft; and
- Free of objects, except for those objects needing to be located in the RSA because of their function.

## **1.3 DESCRIPTION OF PROJECT AREA**

Massport is an independent public agency of the Commonwealth of Massachusetts that owns and operates L. G. Hanscom Field. Hanscom Field is primarily a general aviation airport with limited commercial service and also serves as a general aviation reliever airport for Boston's Logan International Airport. Hanscom Field is listed under the Federal Aviation Administration (FAA) National Plan of Integrated Airport Systems as a primary general aviation and limited commercial service airport.

Hanscom Field is situated on approximately 1,300 acres of land in the towns of Bedford, Concord, Lincoln and Lexington. Hanscom Air Force Base is adjacent to Hanscom Field. Hanscom Field is approximately 14.5 miles northwest of Boston and is generally situated in an area just westerly of I-95/Route 128 near Exit 30 (Route 2A). Route 2A is the primary access

road to the airport. The Minute Man National Historic Park (MMNHP) is located off Route 2A, approximately one-third of a mile at its closest point from the RSA project site. Despite its proximity to MMNHP and adjacent communities, Hanscom Field is visible from only a few locations due to the general topography of the area. See the attached Location Map.

Hanscom Field has two intersecting runways, designated as 11/29 and 5/23. The primary runway is Runway 11/29, which is 150 feet wide by 7,001 feet long, while the secondary Runway 5/23 is 150 feet wide by 5,106 feet long. The primary Runway 11/29 is a “precision instrument” runway because each end of the runway is equipped with Instrument Landing System (ILS) and Medium Intensity Approach Lighting System and Runway Indicator Lights (MALSR), as well as High Intensity Runway Lighting System (HIRLS). In addition, the Runway 11 End is equipped with Precision Approach Path Indicators (PAPI), while Runway 29 is equipped with Visual Approach Slope Indicator (VASI). Runway 11/29 is the preferred runway in poor weather and visibility conditions. The secondary Runway 5/23 is a “non-precision or visual” runway because it is not equipped with an ILS. This runway is also equipped with Medium Intensity Runway Lighting System (MIRLS) and both ends are equipped with VASIs. Hanscom Field has 14 named taxiways serving these two runways. The FAA Airport Reference Code (ARC) is D-III.

In addition, there are over 20 private and Massport-owned hangars and approximately 375 tie-downs on the airfield to service the nearly 400 Hanscom-based aircraft.

## **1.4 EXISTING PROJECT SITE CONDITIONS**

The runway safety area (RSA) improvements are located off each end of Runway 5/23. The RSA for the Runway 5 End is located within the towns of Concord and Lincoln, while the RSA for the Runway 23 End is entirely within the town of Bedford.

### **Runway 5 End Project Site**

The project site at the Runway 5 End, which includes the RSA and immediately adjacent land, is 12.2 acres and consists entirely of paved and turfing areas. The RSA is currently 500 feet wide, 520 feet long on the west edge and 845 feet long on the east edge, with a 200-foot wide paved overrun extending beyond the runway end. (See attached *Runway 5 Existing Conditions Plan*.) The safety area’s longitudinal (along the centerline) and transverse (perpendicular to the centerline) grades are variable and not in compliance with FAA standards. The airport perimeter access road passes through the designated RSA around its perimeter. There are no wetlands near the limits of work.

### **Runway 23 End Project Site**

The project site at the Runway 23 End includes the RSA and adjacent land, is 20.3 acres, and consists of pavement, a gravel perimeter road, turfing areas, areas dominated by shrubs, and ditches. The RSA is currently 300 feet wide and 890 feet long, with a 200-foot wide paved overrun. (See attached *Runway 23 Existing Conditions Plan*.) The longitudinal and transverse grades are variable and not in compliance with FAA standards. The existing airport perimeter

access road is located just outside the currently designated RSA, but will be within the proposed RSA on the south side. The existing perimeter security fencing is located outside of the currently designated RSA, but traverses a portion of the proposed RSA. There is also a bordering vegetated wetland, wetland buffer and drainage ditches located immediately adjacent to the airport perimeter access road and RSA. See Section 2.0 for further information regarding wetland impacts.

## **1.5 IDENTIFICATION AND EVALUATION OF ALTERNATIVES**

In the *Runway 5-23 Safety Area Supplementary Feasibility Analysis* prepared by The Louis Berger Group, Inc. (Berger) for Massport and the FAA, six different alternatives were identified and evaluated. The following information, derived from this feasibility study, provides a summary of the six alternatives evaluated and the basis for selecting the proposed alternative.

Alternative 1 (No Build): For this alternative, the existing RSAs would be maintained as described, with only minor grading modifications, as necessary. Refer to the descriptions above for existing conditions at the Runway 5 and 23 Ends.

Alternative 2 (Full Build): The existing RSAs are improved to meet FAA grading and dimensional standards (1,000 feet long x 500 feet wide). The improved RSAs would be turfed with no additional pavement.

Alternative 3 (Partial Build): Using this alternative, the RSA requirements would be met on the Runway 5 End by using declared distances. Declared distances are a means of obtaining a standard safety area by reducing the usable runway length. A mathematical method is used to determine runway length available. To meet the declared distance standards, the Runway 5 threshold would have to be displaced 480 feet north. On the Runway 23 End, the threshold would be located 110 feet south, thereby providing a full 1000-foot RSA on that end. The RSA at the Runway 23 End would also be widened to 500 feet. The improved RSAs would be turfed with no additional pavement.

Alternative 4 (Improve Existing): The RSA at Runway 5 End would be “squared off” to 700 feet by 500 feet wide. The RSA at the Runway 23 End would be maintained at 890 feet, but widened to 500 feet. The improved RSAs would be turfed with no additional pavement.

Alternative 5 (Declared Distances): Using this alternative, declared distances would be used on both the Runway 5 and Runway 23 Ends. As noted in Alternative 3 above, the Runway 5 threshold would be displaced 480 feet northward. To compensate for the loss of runway length, the first 480 feet of the overrun at the Runway 23 End would be converted to runway so it could be used for takeoffs only. The existing landing threshold for Runway 23 would be displaced by 110 feet southward to meet the declared distance landing criteria. The RSA at Runway 23 would be widened to 500 feet, as required. The improved RSAs would be turfed with no additional pavement.

Alternative 6 (Runway Shift): Using this alternative, the runway would shift northward by 185 feet to provide “balanced” RSAs of 705 feet by 500 feet wide at both ends. This would require shifting the Runway 5 threshold 185 feet northward, while also relocating the Runway 23 threshold 185 northward. The improved RSAs would be turfed with no additional pavement.

In addition to these alternatives, the use of Engineered Materials Arresting Systems (EMAS) was reviewed in the study as only a potential enhancement, but not as a replacement to any of the alternatives.

In evaluating the alternatives, Berger, Massport and the FAA used the guidelines in FAA Order 5200.8 Appendix 2, which state:

*“In evaluating the alternatives...there are many factors that could effect the viability of the alternative. ...Factors to be considered include:*

- a. Historical records of airport accidents/incidents.*
- b. The airport plans as reflected in...volume of passengers, number of operations, design aircraft and percent runway use, both for all weather and Instrument Flight Rules (IFR) operations.*
- c. The extent to which the existing RSA complies with the standard...*
- d. Site constraints.*
- e. Weather and climatic conditions.*
- f. Availability of visual and electronic aids for landing.”*

During the evaluation process by Berger, Massport and FAA, these criteria were refined further as follows:

- A. Historical Records Review: The National Transportation Safety Board (NTSB) records for accidents or incidents at Hanscom were reviewed for the period from 1980 to 2000, but none of the 14 accidents/incidents (all nonfatal) noted involved any runway overrun or undershoot and none made any reference to Runway 5/23. Therefore, this criterion was not used in the final Berger evaluation process.
- B. Airport Plans Review: Although there is commercial passenger service at Hanscom, these associated operations are not a significant percentage of the total activity. Massport envisions that Hanscom will remain a general aviation airport for primarily corporate and general aviation users with niche commercial service. Therefore, the needs and performance characteristics of the design aircraft for the RSA analyses were based on the larger corporate kind of jet using the facility, not a smaller general aviation or larger commercial type aircraft. The FAA designated aircraft was a D-III type aircraft (Gulfstream V or equivalent).
- C. RSA Standards Compliance: Since Hanscom is a general aviation airport, it serves a variety of business and corporate jets which have high approach speeds and have the ability to carry heavy loads. It is noted that Runway 5/23 is not the primary runway, and is used most heavily during the summer months when the prevailing winds are favorable for its use.
- D. Site Constraints: To the north of the Runway 23 End, there are substantial wetland areas, as well as property not owned by Massport. To the south of the Runway 5 End, a public and

historic road (Virginia Road) is located immediately next to the safety area. In addition, there are approach surface penetrations, particularly at the north end, which lie within the wetlands or Bedford Town Forest.

- E. Weather Conditions: As noted above, Runway 5/23 is the secondary runway for Hanscom. Runway 23 is equipped with non-precision approaches, but will not generally be used for low visibility conditions. Also as noted above, Runway 5/23 is generally used only during the summer months, when more severe weather conditions of snow and icing do not occur. Therefore, weather conditions were not explicitly used as part of the Berger evaluation process.
- F. Availability of Visual and Electronic Aids for Landing: Both ends of Runway 5/23 have Visual Approach Surface Indicators (VASI-4) visual aids. However as noted above, only Runway 23 has electronic non-precision approaches (Very High Frequency Omnidirectional [VOR] and Global Positioning System [GPS]). The presence of the VASI-4 on both runways should help reduce the risk of runway overruns or undershoots. Therefore, the alternatives evaluation will not explicitly use the availability of visual or electronic aids as an evaluation criterion.
- G. Other Factors: Other factors used in the evaluation process were community impacts and project costs. The community impacts were any historic or other environmental impacts (in addition to wetland impacts), such as the potential effect on Virginia Road noted above. Thus, these other factors were used in the Berger evaluation process.

Therefore, the primary evaluation criteria used by Berger and Massport for selecting the alternatives were the airport plans, standards compliance, site constraints and other factors such as community impacts and project costs. An analysis of these evaluation criteria follows:

Aircraft Performance (Airport Plans): The declared distance options were evaluated for the four calculated runway distances; Takeoff Run Available (TORA), Takeoff Distance Available (TODA), Accelerate Stop Distance Available (ASDA), and Landing Distance Available (LDA), for the design aircraft (D-III) and 9 other typical aircraft using Hanscom. FAA stresses that the use of declared distances “*shall be limited to cases where it is impracticable to provide the RSA... in accordance with the FAA design standards*”. In addition, declared distances which result in reduced runway length may also be considered impracticable and may only be applicable for runways that have existing lengths which exceed the requirements for the current or projected design aircraft operations.

Based on the Berger report, the existing Runway 5/23 length already restricts 6 of the 10 aircraft analyzed by an average of 6 percent loss with regard to their range on a Standard Day (i.e. ambient temperature of 59° F). Furthermore, by having the runway lengths shortened by approximately 600 feet using declared distances, 8 of the 10 aircraft analyzed were affected and increased the average range loss to approximately 16 percent. It is noted that these percentage loss increases were even greater when analyzing these conditions on a Hot Day (i.e. ambient temperature of 85° F), because runway length demands increase in hot conditions. Therefore, the declared distance options (Alternative 3 and 5) do not appear to be reasonable with regard to aircraft performance based on the FAA design standards.

RSA Standards Compliance: The standard RSA dimensions for Hanscom are 500 feet wide by 1000 feet long, or 500,000 SF (11.48 Acres). Alternatives 2, 3 and 5 would meet these dimensions; Alternative 1 would not increase the size of the RSA. Alternatives 4 and 6 would have minimal gains of 3.7% and 4.4% respectively for the Runway 5 End, whereas there would be a 66.7% and 32% gain respectively for the Runway 23 End. Therefore, with respect to the RSA standards compliance, Alternatives 2, 3 and 5 would obtain this goal, and Alternatives 4 and 6 would have significant increases on the Runway 23 End.

Site Constraints (Wetlands): There will be no impacts to wetlands on the Runway 5 End for any of the alternatives. Also, none of the RSA improvement alternatives will increase any impervious surface areas at this runway end since the areas to be improved are already vegetated and not paved and the improvements will restore the vegetated areas.

Except the Alternative 1 (No Build) option, each of the above-referenced RSA alternatives for the Runway 23 End would result in wetland impacts. Based on the Berger study, Alternatives 4 (Improve Existing), 5 (Declared Distances) and 6 (Runway Shift) each would entail approximately 1.0 acres of wetland impact. Impacts to wetlands for Alternative 2 (Full Build) and Alternative 3 (Partial Build) were estimated at 2.7 acres and 1.6 acres, respectively. However, it should be noted that since the Berger study has been published, the 1996 wetland delineation (which was approved in 1998) on which the Berger impact calculations were based has been updated. As such, the current estimated area of disturbance for Alternatives 4, 5 and 6 has been modified to about 2.10 acres. Although not quantified, the larger footprints required for Alternatives 2 and 3 would yield substantially more impacts to wetlands than the 2.10 acres presently associated with Alternatives 4, 5 and 6. Accordingly, based on both the Berger study and up-to-date wetland impact calculations, the implementation of either Alternatives 4, 5 or 6 would result in the least impacts to wetlands.

Site Constraints (Surface Penetrations): From the Berger study, a penetration study performed by Massport during 1999 identified trees, shrubs and other objects penetrating or in danger of penetrating the imaginary surfaces associated with runways. The study noted that none of the alternatives increased the existing penetrations to the Runway 5 End, while Alternatives 2, 3 and 5 increased the number of penetrations at the Runway 23 End. Therefore, Alternatives 2, 3 or 5 would be the least desirable with respect to surface penetrations for the Runway 23 End.

Site Constraints (Virginia Road Relocation): From the Berger study, there are only two alternatives that would have required relocation of Virginia Road at the Runway 5 End with the remaining alternatives not having any impact. In Alternative 2 (Full Build), there would be approximately 2,200 feet of roadway relocation, while there would be approximately 1,000 feet of roadway relocation for Alternative 4 (Improve Existing). Each of these alternatives would require a significant amount of earth removal due to the existing rising terrain and also require a land transfer from private property to Massport, and relocation of the roadway right-of-ways in both Lincoln and Concord. Although the section of Virginia Road abutting the project is not considered a historic roadway by definition, the National Park Service is seeking Historic Landmark designation for other portions of this roadway, and local town officials note that



Virginia Road is the oldest public road in the area. Therefore, Alternatives 2 and 4 would be the least desirable alternatives because of the impacts to a potentially historic roadway.

EMAS Review: EMAS (Engineered Materials Arrestor System) is a product that utilizes lightweight concrete to slow an aircraft to a stop. An EMAS bed is placed at the end of the runway which consists of lightweight concrete blocks which are designed to crush under the weight of an aircraft, thereby slowing the aircraft safely to a stop.

Based on the Berger study, EMAS was evaluated as only an enhancement to the other alternatives. It was determined that an EMAS arrestor bed of 160 to 270 feet long by 168 feet wide for the Runway 5 End, and 160 feet by 168 feet wide for the Runway 23 End could be installed. However the cost implications were approximately \$3.1 million for the Runway 5 End and \$2.53 million for the Runway 23 End for installation and site preparation work in addition to cost for other RSA improvements.

Based on the evaluation process of all of the alternatives conducted by Berger with review by Massport and approval from FAA, the selected alternatives for Runway 5 and Runway 23 are Alternative 1 (No Build) and Alternative 4 (Improve Existing), respectively. Also due to the increased cost implications, EMAS was not chosen to enhance either of these selected RSA improvement alternatives. The selected alternatives bring the safety areas closer to compliance with FAA regulations and enhance airplane/passenger safety. The alternatives have minor wetland impacts, require no vegetation removal outside of currently managed areas, and maintain the current runway lengths. Wetland mitigation will be implemented in conjunction with the selected alternative.

## **1.6 PROPOSED IMPROVEMENTS**

The proposed improvements outlined below will enhance the safety of airport users by providing improved safety areas at each end of the runway, and will not change the runway length or how the runway is used.

### Runway 5 End Safety Area (Alternative 1)

The proposed improvements for the Runway 5 RSA are shown on the *Runway 5 Grading Plan* attached to this ENF. As noted above, the published Runway 5 End Safety Area is currently 500 feet wide, 520 feet long on the west edge, 682 feet along the extended runway centerline, and 845 feet long on the east edge, with a 200 feet wide paved overrun. These published dimensions were recently modified from a previously published configuration to remove a portion of the security fence and Virginia Road from the RSA. The existing security fence and Virginia Road now run along the southerly side of this configuration outside of the published limits.

In summary, the proposed improvements for Runway 5 RSA shall include:

- Retain the paved overrun area in its current configuration;
- Retain the size and shape of the RSA configuration as noted above; and
- Re-grade turfed areas, as necessary, which do not meet the FAA standards.

#### Runway 23 End Safety Area (Alternative 4)

The proposed improvements for the Runway 23 End are shown on the *Runway 23 Site Plan* and *Runway 23 Grading Plan* attached to this ENF. As noted above, the published Runway 23 Safety Area is currently 300 feet wide and 890 feet long, but the proposed RSA is 500 feet wide, 890 feet long as accepted by the FAA, see Appendix D for a copy of the acceptance letter. The paved overrun is to remain as currently configured. In general, the majority of the turfed areas within the existing 300 feet RSA meet transverse grading standards, with the exception of a flat spot within the first 50 feet on the south side of the runway that does not meet standards. The areas between the existing 300 feet RSA limits and the proposed 500 feet RSA do not meet standards and will be re-graded. The wetland soils within the proposed RSA will be replaced with turf-covered, structurally competent materials to support the loads of snow removal and emergency equipment. The existing drainage ditch along the RSA (Wetland B on the Runway 23 End plans) will not be affected by the proposed re-grading.

The existing airfield perimeter access road on the east side of the RSA traverses a portion of the proposed RSA limits. The airfield perimeter access road will be relocated to the extreme outer limit of the proposed RSA in this area. While it is desirable to remove the perimeter road from the RSA, to do so would create additional wetland impacts and therefore increase disturbance to natural resources and project costs. The effect of leaving the perimeter road within the RSA is that vehicles traveling the road will be within the safety area for a small additional amount of time (i.e. approximately 20 seconds at 30 mph). Given that the perimeter road is infrequently used and the vehicles are in contact with the tower, safety concerns should not be an issue.

The existing airfield perimeter access road west of the RSA traverses a portion of the RSA. It will be relocated outside the safety area to intersect with Taxiway R at the hold line. Relocating the road will also facilitate grading the RSA to standards. Also as noted above, the existing perimeter fencing traverses a portion of the proposed RSA. The perimeter fencing will be relocated outside the proposed safety area to meet the requirement that the RSA be free of objects.

In summary, the proposed improvements at the Runway 23 End shall include:

- Retain the existing paved overrun area in its current configuration;
- Widen the existing RSA from 300 feet to 500 feet, with no increase in pavement or impervious area;
- Grade the RSA to conform to FAA longitudinal and transverse standards as referenced in the most recent FAA Advisory Circular 150-5300-13;
- Relocate a portion of the airfield perimeter access road to the edge of the RSA; and
- Relocate the perimeter security fence in conjunction with road relocation.

## **1.7 POTENTIAL MITIGATION MEASURES**

The proposed RSA improvements at the Runway 23 End will require disturbance of approximately 2.10 acres of bordering vegetated wetlands. Potential wetland mitigation sites on Hanscom Field are discussed in Section 2.0 of this document. Inasmuch as rare species are not expected to be adversely affected by proposed activities, mitigation in this regard is not anticipated to be required.

## **2.0 WETLANDS, WATERWAYS AND TIDELANDS**

This section addresses wetland resources associated with the proposed Runway 5/23 Safety Area Improvements Project at Hanscom Field. Specifically, documentation is provided with respect to existing resource conditions, followed by discussions of project-related resource impacts/mitigation measures and regulatory compliance.

Due to its inland location, no tidelands are associated with Hanscom Field; hence, no discussions in this regard are provided herein or elsewhere in this ENF.

### **2.1 MEPA THRESHOLDS**

Pursuant to the MA Environmental Policy Act (MEPA) regulations at 301 CMR 11.03(3), the preparation/filing of both an ENF and EIR are mandatory for projects involving certain activities or exceeding specified thresholds. Two of these “review thresholds” pertain to projects that require a Variance in accordance with the MA Wetlands Protection Act and/or alter more than one acre of bordering vegetated wetlands (BVW). As proposed, safety area improvements at the Runway 23 End will meet and exceed these two review thresholds, respectively. Accordingly, the preparation/filing of an ENF and EIR, followed by a determination of “adequate and proper compliance” made by the Secretary of the Executive Office of Environmental Affairs (EOEA) on the Draft and Final EIR, will be required to comply with the provisions of MEPA.

### **2.2 WETLAND RESOURCE DELINEATION/CONFIRMATION AND EXISTING RESOURCE CONDITIONS**

As described in the following sections, wetland resources are limited to the proposed safety area at the Runway 23 End. No wetland resources occur at or within 100 feet of the proposed safety area at the Runway 5 End. Accordingly, the subsequent discussion of wetland resources is limited to existing wetland resource conditions, project-related impacts/mitigation measures and regulatory compliance in conjunction with proposed safety area improvements at the Runway 23 End.

#### **2.2.1 Resource Delineation/Confirmation**

Prior to the filing of a Notice of Intent (NOI) for implementation of the most recent Vegetation Management Plan (VMP) at the Runway 5, 11, 23 and 29 Ends, vegetated wetlands were delineated at and proximate to each of these locations by a Dufresne-Henry, Inc. wetland scientist. As described in the *2002 – 2006 Vegetation Management Plan for the Laurence G. Hanscom Field* (Dufresne-Henry, Inc.; March 2002), the delineation of vegetated wetlands was conducted in accordance with *Delineating Bordering Vegetated Wetlands under the MA Wetlands Protection Act* (MA Department of Environmental Protection (DEP), 1995). With respect to vegetated wetlands subject to Federal jurisdiction/regulation, boundaries were determined in accordance with the (U.S. Army) *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory, 1987).

Subsequent to the delineation effort, an Abbreviated Notice of Resource Area Delineation was filed with the Bedford Conservation Commission (BCC), after which the wetland boundaries were reviewed by members of the BCC and/or its agent. Following this review period, an Order of Resource Area Delineation (ORAD) confirming the location/boundaries of vegetated wetlands was issued by the BCC on 3 December 2001. Prior to the expiration of the ORAD, however, the BCC issued an Order of Conditions for the proposed VMP. This Order, issued on 7 March 2003, is valid for a period of five years, i.e., until 7 March 2008. Accordingly, the delineation as approved by the BCC also remains valid until the expiration of the VMP Order of Conditions.

As indicated on the vegetated wetland plans approved by the BCC, no wetlands occur at or within 100 feet of the proposed safety area at the Runway 5 End. The BCC-approved locations of vegetated wetlands at the Runway 23 End are presented on the *Runway 23 Existing Conditions Plan* attached to the Environmental Notification Form.

### **2.2.2 Existing Wetland Resource Conditions**

Table 2-1 presents a summary of resource areas associated with wetlands within and surrounding the proposed safety improvements project area at the Runway 23 End. For the purposes of this ENF, Wetland A refers to the wetland on airport property at the end of and adjacent to Runway 23. Wetland B consists of the wetland east of the Runway 23 End and the adjacent perimeter road, while Wetland C includes the headwater wetlands of Hartwell Brook northeast of the Runway 23 End perimeter road. Each of these wetland areas is identified on the *Runway 23 Existing Conditions Plan*.

#### **2.2.2.1 Vegetated Wetlands**

All vegetated wetlands within the Runway 23 End Safety Area Improvements project site constitute bordering vegetated wetlands and are subject to regulation at the Federal (U.S. Army Corps of Engineers (COE)) and State (DEP) levels, with the MA Wetlands Protection Act/regulations being administered by the BCC. As Table 2-1 indicates, the majority of vegetated wetlands are dominated by scrub/shrub communities, although some herbaceous and tree species characteristic of emergent and forested wetlands, respectively, also are present.

For the most part, the scrub/shrub community at Wetland A consists of red maple (*Acer rubrum*), gray birch (*Betula papyrifera*), alder (*Alnus rugosa*), silky dogwood (*Cornus amomum*), highbush blueberry (*Vaccinium corymbosum*), elderberry (*Sambucus canadensis*), pussy willow (*Salix discolor*), glossy buckthorn (*Frangula alnus*), meadowsweet (*Spiraea alba*, var. *latifolia*), cattail (*Typha latifolia*), arrow-leaved tearthumb (*Polygonum sagittatum*), purple loosestrife (*Lythrum salicaria*), soft rush (*Juncus effusus*) and sensitive fern (*Onoclea sensibilis*). Many of these species also are associated with Wetlands B and C.

A representative list of plant species associated with vegetated wetlands in the Runway 23 End project area and environs is provided in Table 2-2. Plant species associated with upland communities, including the maintained open space at the runway end, are listed in Table 2-2 as well.

**TABLE 2-1**  
**SUMMARY OF WETLAND RESOURCE AREAS**

Wetland	Dominant Cover Type*	Bank	BORDERING VEGETATED WETLAND	LAND UNDER WATER BODIES/WATERWAYS	ISOLATED LAND SUBJECT TO FLOODING	BORDERING LAND SUBJECT TO FLOODING	RIVERFRONT AREA
A	SS	Y	Y	Y	--	--	--
B	EM/SS	Y	Y	Y	--	--	--
C	SS	Y	Y	Y	--	--	--

\* Key to Cover Types (SS = Scrub/Shrub; EM = Emergent)

Note: In accordance with *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin *et al.*, 1979), all project area vegetated wetlands constitute Palustrine wetlands. By definition, wetlands associated with the Palustrine System include all non-tidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derives salts is below 0.5 parts per thousand (ppt).

**TABLE 2-2  
REPRESENTATIVE LIST OF PLANT SPECIES**

Scientific Name	Common Name	WETLAND	UPLAND
<b>TREES/SAPLINGS</b>			
<i>Acer rubrum</i>	Red maple	X	X
<i>Pinus strobus</i>	White pine	X	X
<i>Populus deltoides</i>	Cottonwood		X
<i>Prunus serotina</i>	Black cherry		X
<i>Quercus rubra</i>	Red oak		X
<b>SHRUBS/VINES</b>			
<i>Betula populifolia</i>	Gray birch	X	X
<i>Cornus amomum</i>	Silky dogwood	X	
<i>Frangula alnus</i>	Glossy buckthorn	X	X
<i>Ilex verticillata</i>	Winterberry	X	
<i>Kalmia angustifolia</i>	Sheep laurel		X
<i>Lonicera morrowii</i>	Morrow's honeysuckle	X	
<i>Lythrum salicaria</i>	Purple Loosestrife	X	
<i>Myrica pensylvanica</i>	Bayberry		X
<i>Rosa multiflora</i>	Multiflora rose	X	
<i>Rubus allegheniensis</i>	Highbush blackberry		X
<i>Salix discolor</i>	Pussy willow	X	
<i>Sambucus canadensis</i>	Elderberry	X	
<i>Vaccinium corymbosum</i>	Highbush blueberry	X	
<b>HERBACEOUS/GROUND COVER</b>			
<i>Carex stricta</i>	Tussock sedge	X	
<i>Daucus carota</i>	Wild carrot		X
<i>Juncus effusus</i>	Soft rush	X	
<i>Oenothera biennis</i>	Evening primrose		X
<i>Onoclea sensibilis</i>	Sensitive fern	X	
<i>Phytolacca americana</i>	Pokeweed	X	
<i>Plantago lanceolata</i>	Narrow-leaved plantain		X
<i>Polygonum sagittatum</i>	Arrow-leaved tearthumb	X	
<i>Potentilla canadensis</i>	Cinquefoil		X
<i>Schizachyrium scoparium</i>	Little bluestem		X
<i>Spiraea alba</i> , v. <i>latifolia</i>	Meadowsweet	X	
<i>Spiraea tomentosa</i>	Steeplebush	X	
<i>Trifolium arvense</i>	Rabbit-foot clover		X
<i>Typha latifolia</i>	Broad-leaved cattail	X	

**2.2.2.2 Other Wetland Resources****Land Under Water Bodies/Waterways and Banks**

In addition to vegetated wetlands, land under water bodies/waterways and banks also are associated with the Runway 23 End project area (*see Runway 23 Existing Conditions Plan*). These resource areas are subject to regulation at the Federal (COE) and State (DEP)/municipal (BCC) levels. Pursuant to the MA Surface Water Quality Standards (314 CMR 4.00 *et seq.*), all waters/wetlands associated with the Runway 23 End constitute Class B waters.

Water bodies are associated with each of the wetlands at the Runway 23 End. These include an area of standing water within Wetland A, a water body that originates at a 48 inch stormwater discharge pipe east of the runway end (Wetland B) and a contiguous area of standing water interspersed with vegetated wetlands located approximately 50 feet northeast of the existing runway pavement (Wetland C). Waterways consist of two (2) intermittent channels within Wetland A that extend landward from the area of standing water. These waterways are located northwest and southeast of the runway end.

During field investigation in November 2004 and April 2005, no flow was observed in any project area wetlands, including the culvert connecting Wetlands A and C that occurs beneath the perimeter road northeast of the runway end. Rather, standing water was observed in all wetlands. Within Wetland A, several branches were noted that recently had been cut and their bark consumed by beavers. Based on this evidence, as well as the presence of standing water, it is expected that beavers have dammed Hartwell Brook at one or more downstream locations, interrupting normal flows and flooding backwater areas up to and including Wetlands A, B and C. Based on discussions with Randall Christensen (Dufresne-Henry, Inc.), these same beaver-generated conditions prevailed during the 2001 time period when vegetated wetlands were delineated at the Runway 23 End (Personal Communication; March 11, 2005).

As indicated in Table 2-1, banks occur in conjunction with each project area water body/wetland, with bank heights and slopes varying upon site-specific locations.

**Land Subject to Flooding**

With respect to bordering land subject to flooding, flood maps for the Town of Bedford were reviewed to determine the presence/absence and location of this wetland resource. Specifically, the following source materials were examined:

- Federal Emergency Management Agency. July 4, 1988. *Flood Insurance Study – Town of Bedford*. National Flood Insurance Program.
- Federal Emergency Management Agency. July 4, 1988. *Flood Insurance Rate Map – Town of Bedford*. National Flood Insurance Program.
- Federal Emergency Management Agency. July 4, 1988. *Flood Boundary and Floodway Map – Town of Bedford*. National Flood Insurance Program.



Based on a review of these documents, no bordering land subject to flooding occurs within or proximate to the proposed Runway 5/23 safety improvements project area.

### **Riverfront Area**

Proximate to the Runway 23 End project area, only Hartwell Brook is designated as a perennial stream on the U.S. Geological Survey (USGS) topographic map for the Maynard quadrangle (1987). As stated above, however, downstream beaver activity has altered hydrologic conditions such that the upper reaches of Hartwell Brook (Wetland C) actually consist of a large expanse of standing water that extends into Wetlands A and B. Additionally, the surface water features at Wetlands A and B are not shown on the USGS map (Maynard quadrangle, 1987). Moreover, Wetlands A and B have contributing drainage areas of less than 25 acres (0.038 square miles) and 97 acres (0.15 square miles), respectively, based on drainage area boundaries delineated by W/W and drainage area measurements calculated by Maptech® Terrain Navigator software.

Accordingly, no State-regulated riverfront areas (RFA) are associated with the project area at the Runway 23 End.

## **2.2.3 Wetland Functional Assessment**

### **2.2.3.1 Federal Functions/Values**

As listed and described in *The Highway Methodology Workbook Supplement – Wetland Functions and Values/A Descriptive Approach* [COE/New England Division; November 1995], eight (8) functions and five (5) values may be associated with a given wetland. These functions/values include:

#### **FUNCTIONS**

- Groundwater Recharge/Discharge
- Floodflow Alteration (Storage and Desynchronization)
- Fish and Shellfish Habitat
- Sediment/Toxicant/Pathogen Retention
- Nutrient Removal/Retention/Transformation
- Production Export
- Sediment/Shoreline Stabilization
- Wildlife Habitat

#### **VALUES**

- Recreation (Consumptive and Non-Consumptive)
- Education/Scientific Value
- Uniqueness/Heritage
- Visual Quality/Aesthetics
- Endangered Species Habitat

Table 2-3 presents a preliminary summary matrix of wetland functions/values for project area wetlands based on field investigations conducted in November 2004 and April 2005. As this table indicates, all wetlands exhibit a variety of functions and do not serve any of the above-referenced values. With respect to Wetland B, the wetland's principal function pertains to "sediment/toxicant/pathogen retention". This is due to the discharge of stormwater runoff from the airport to this wetland and, therefore, the increased opportunity for the wetland to trap and/or serve as a "sink" for potential runoff-related contaminants. Due to the diversity of wetland habitats associated with Wetland C, including the presence of open water of variable depths, "wildlife habitat" is the principal function served by this wetland. No principal functions are associated with Wetland A, due primarily to the occurrence of periodic maintenance activities (e.g., mowing) adjacent to the wetland, and its relatively isolated status relative to surrounding upland and wetland communities.

As further indicated in Table 2-3, "endangered species habitat" is not known to be associated with any of the Runway 23 End project area wetlands.<sup>1,2</sup> The proposed safety area at the Runway 23 End, including herbaceous uplands and wetlands, is not managed for grassland bird breeding habitat and is mowed frequently to discourage nesting. Additionally, while elderberry (*Sambucus canadensis*) occurs within Wetland A, the elderberry long-horned beetle (*Desmocerus palliatus*), a State-listed species of special concern, has not been recorded as occurring in this wetland area. Based on past correspondence and communication with the MA Natural Heritage & Endangered Species Program, this species is "known to occur in the vicinity of the [vegetation management plan] project site" but not within the boundaries of Hanscom Field.

### **2.2.3.2 Statutory Interests – MA Wetlands Protection Act/Regulations**

In accordance with the MA Wetlands Protection Act regulations, wetland resource areas are presumed significant to a variety of statutory interests. Wetlands exhibiting land under water bodies/waterways, banks and bordering vegetated wetlands are presumed significant to each of the statutory interests cited at 310 CMR 10.01(2), with the exception of the "protection of land containing shellfish" which exclusively pertains to coastal resources.

However, the actual significance of these resource areas with respect to the statutory interests is dependent upon such factors as the soil permeability, the presence/absence of downstream public water supplies, the presence/absence of flood-prone areas and landscape position. Wetland resources that are tributary and contribute to public/private water supplies are significant to this statutory interest; resources that are not tributary and do not contribute to public/private water supplies are not significant in this regard. Additionally, headwater resources and resources located in the upper reaches of watersheds typically do not function with respect to flood control/storm damage prevention. This is evidenced by the flood maps for Bedford.

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<sup>1</sup> MA Natural Heritage & Endangered Species Program. July 19, 2001. Letter to Randall Christensen (Dufresne-Henry, Inc.) regarding the 2002 – 2006 Vegetation Management Plan. MA Division of Fisheries & Wildlife. Westborough, MA.

<sup>2</sup> Massachusetts Port Authority. July 2002. *2000 L. G. Hanscom Field Draft Environmental Status and Planning Report(ESPR)*. Prepared for Massport by Rizzo Associates. East Boston, MA.

**TABLE 2-3**  
**PRELIMINARY FEDERAL WETLAND FUNCTIONS/VALUES EVALUATION**  
**MATRIX**

<b>WETLAND FUNCTION/VALUE</b>	<b>WETLAND A</b>	<b>WETLAND B</b>	<b>WETLAND C</b>
<b>Groundwater Recharge</b>	X	X	X
<b>Groundwater Discharge</b>	X	X	X
<b>Floodflow Alteration</b>	X	X	X
<b>Fish and Shellfish Habitat</b>	--	--	--
<b>Sediment/Toxicant/Pathogen Retention</b>	--	P	X
<b>Nutrient Removal/Retention/ Transformation</b>	--	X	X
<b>Production Export</b>	--	X	X
<b>Sediment/Shoreline Stabilization</b>	--	X	--
<b>Wildlife Habitat</b>	X	X	P
<b>Recreation</b>	--	--	X
<b>Education/Scientific Value</b>	--	--	X
<b>Uniqueness/Heritage</b>	--	--	--
<b>Visual Quality/Aesthetics</b>	--	--	X
<b>Endangered Species Habitat</b>	--	--	--
<b>Other:</b>	--	--	--

\* X = Wetland Exhibits Function/Value  
P = Principal Wetland Function/Value

In light of the above, Table 2-4 presents a listing of project area wetlands and the statutory interests applicable to these areas. Each project area wetland is tributary and contributes to a Zone I and Zone II water supply area located downstream along the Shawsheen River in the Town of Bedford (Source: MassGIS 2005). Consequently, these wetlands are considered to play a role with respect to public/private water supply and groundwater supply. With the exception of fisheries, Wetlands B and C also are anticipated to play a role relative to flood control/storm damage prevention, pollution prevention and wildlife habitat.

**TABLE 2-4**  
**PRELIMINARY STATE WETLAND STATUTORY INTERESTS EVALUATION**  
**MATRIX**

<b>STATUTORY INTEREST</b>	<b>WETLAND A</b>	<b>WETLAND B</b>	<b>WETLAND C</b>
Public/Private Water Supply	X	X	X
Groundwater Supply	X	X	X
Flood Control	--	X	X
Storm Damage Prevention	--	X	X
Pollution Prevention	--	X	X
Fisheries	--	--	--
Wildlife Habitat	X	X	X

X = Wetland Contributes to Statutory Interest

In contrast, it is important to note that Wetland A is separated from the downstream wetland complex by a culvert beneath the runway end perimeter road that only is approximately 12 inch in diameter. As noted previously, the drainage area contributing to Wetland A also is limited. As such, this wetland does not play a substantive role, if any, in terms of flood control/storm damage prevention and pollution prevention. However, the plant communities associated with Wetland A are expected to provide wildlife habitat for at least some species and, accordingly, play a role in this regard.

## **2.3 WETLAND RESOURCES IMPACTS**

### **2.3.1 Wetland Resource Impact Area**

All waters and wetlands affected by the proposed safety area improvements at the Runway 23 End are subject to regulation under Section 404 of the Clean Water Act, administered by the COE. These waters/wetlands also are subject to regulation under Section 401 of the Clean Water Act, administered by the DEP, as well as the MA Wetlands Protection Act and implementing regulations administered by the BCC.

As indicated in Table 2-5, proposed safety area improvements will affect approximately 350 linear feet (LF) of banks associated with land under water bodies, 60 LF of banks associated with

the intermittent channel southeast of the Runway 23 End, 875 square feet of land under water bodies (175 LF x 5 feet [average width of water body]) and 91,413 square feet (SF; 2.10 acres) of vegetated wetlands, all located within the Merrimack River watershed (USGS Cataloging/Hydrologic Unit 01070002). Of these totals, all bank-related impacts and approximately 87,262 SF (2.00 acres) of impacts to vegetated wetlands will be associated with Wetland A (see *Runway 23 Site Plan and Grading Plan*). Impacts to Wetland B will be limited to approximately 4,151 SF (0.10 acres) of vegetated wetlands. Wetland C will not be affected by project implementation. Collectively, buffer zone impacts associated with Wetlands A, B and C will total approximately 191,225 SF (4.39 acres).

**TABLE 2-5  
SUMMARY OF WETLAND RESOURCE IMPACTS**

<b>RESOURCE AREA</b>	<b>WETLAND A</b>	<b>WETLAND B</b>	<b>WETLAND C</b>	<b>TOTAL</b>
Land Under Water Body (Square Feet)	875	--	--	875
Bank (Linear Feet)	410	--	--	410
Bordering Vegetated Wetland (Square Feet)	87,262	4,151	--	91,413

Inasmuch as the proposed project at the Runway 23 End will affect greater than 50 LF of bank, a wildlife habitat evaluation addressing bank impacts will be required. This evaluation will be conducted in accordance with the MA Wetlands Protection Act regulations, and DEP Wetlands Program Policy 88-1 and Wetlands Wildlife Advisory #2. Collectively, these source materials document wildlife evaluation procedures. Data forms included in these Advisories will be completed and an analysis of the significance of resource impacts from a wildlife perspective will be provided in the Draft EIR.

### **2.3.2 Wetland Functions/Values Impacts**

As indicated in Table 2-5 above, project-related impacts to wetland functions and State-listed statutory interests primarily will be limited to Wetland A. Vegetated wetlands at Wetland B also will be affected, with these impacts being peripheral to the wetland's primary open water feature that provides the wetland's paramount functions/values. As such, the functions and statutory interests associated with Wetland B will continue to be performed, albeit in a somewhat diminished capacity. The functional status of Wetland C will remain unchanged. No values as listed by the COE in *The Highway Methodology Workbook Supplement – Wetland Functions and Values/A Descriptive Approach* are associated with project area wetlands.

## **2.4 MITIGATION MEASURES**

### **2.4.1 Design and Construction Measures**

During subsequent design phases, the design of the proposed safety area at the Runway 23 End will be refined. During this process and to the extent allowable under operative Federal Aviation Administration (FAA) design standards for runway end safety area improvements, all practicable avoidance/minimization measures relative to wetland resources will be incorporated into the safety area design. In this regard and again, to the extent practicable, Best Management Practices (BMPs) will be integrated into the stormwater management plan associated with proposed safety area improvements, in accordance with the DEP *Stormwater Management Policy* (November 18, 1996) and *Stormwater Technical Handbooks* (March, 1997).

Prior to construction, the boundaries of adjacent wetlands will be flagged, as will the limits of construction, to preclude unnecessary disturbances. Hay bales and/or silt fencing also will be installed to control soil erosion and sedimentation with respect to nearby resources. These erosion controls will be implemented in accordance with the Stormwater Pollution Prevention Plan (SWPPP) which will be prepared for the project in conjunction with the National Pollutant Discharge Elimination System (NPDES) Permit. The installation of soil erosion and sediment controls will comply with the *Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas* (Franklin, Hampden, Hampshire Conservation Districts; March 1997). Once installed, these controls will be inspected and maintained periodically, as required, until such time that their removal is approved by the COE, DEP and the BCC, as appropriate.

As described in the following section, however, a comprehensive wetland resource compensation plan will be designed and implemented to fully compensate for project-related impacts to wetland resources.

### **2.4.2 Wetland Compensation Plan**

The identification, screening, selection, planning, implementation and monitoring of the wetland compensation site(s) will be conducted in accordance with Federal and State regulatory and guidance materials including, but not necessarily limited to:

#### **FEDERAL**

- The Memorandum of Agreement Between the Environmental Protection Agency and the Department of the Army Concerning the Determination of Mitigation Under the Clean Water Act Section 404(b)(1) Guidelines (February 1990);
- Regulatory Guidance Letter No. 02-2 (COE; December 24, 2002);
- Mitigation Checklist and Guidance (COE/New England District; June 15, 2004);

#### **STATE**

- The MA Wetlands Protection Act/regulations (310 CMR 10.55(4)(b)); and
- The *MA Inland Wetland Replication Guidelines* (MA DEP; March 2002).

In accordance with these documents, sites suitable for the restoration and establishment/creation of wetland resources (i.e., banks and vegetated wetlands) on airport property will be sought. Throughout the site screening and selection process, the provision of at least a one-to-one replacement of affected wetland resource functions/values and State-listed statutory interests, as well as affected wetland acreage, will constitute the primary goal/objective of the overall wetland compensation plan. Also key to this process will be the availability of water sources required to sustain the site(s) as a viable wetland community, as well as the presence/absence of viable upland habitats at potential compensation sites. As stated in the *MA Inland Wetland Replication Guidelines*, “Applicant should consider avoiding valuable upland wildlife habitats such as mature forests so that inadvertent impacts to upland animal or plant species do not result [from replication plan implementation at upland sites].”

During the overall EIR review process, the identification, screening and selection process will be presented to COE, DEP and the BCC for concurrence with the selected wetland compensation site(s). Once confirmed, detailed grading and planting plans will be prepared and incorporated into environmental permit applications, including the Request for Variance to be filed with the DEP Commissioner. In addition to these plans, specifications regarding compensation site preparation, planting and monitoring/maintenance, consistent with Federal and State guidelines, also will be prepared and incorporated into environmental permit applications.

To date, one potential wetland restoration site and one potential wetland establishment/creation site have been identified on airport property. As indicated in Figure 2-1, the potential wetland restoration site is located north of Runway 11 and is referenced in the *Final Shawsheen River Watershed Wetlands Restoration Plan*.<sup>3</sup> As described therein, this “high priority” restoration site consists of approximately 2 – 4 acres in the Elm Brook watershed which, like the wetlands at the Runway 23 End, are tributary to the Shawsheen River. The potential wetland establishment/creation site is located immediately east of Wetland B, within an area approved for vegetation management (see Figure 2-2). Each of these sites will be subject to more detailed field investigations, the results of which will be presented in the Draft EIR.

## **2.5 REGULATORY COMPLIANCE**

### **2.5.1 Regulatory Programs of the U.S. Army Corps of Engineers and U.S. Environmental Protection Agency Section 404(b)(1) Guidelines**

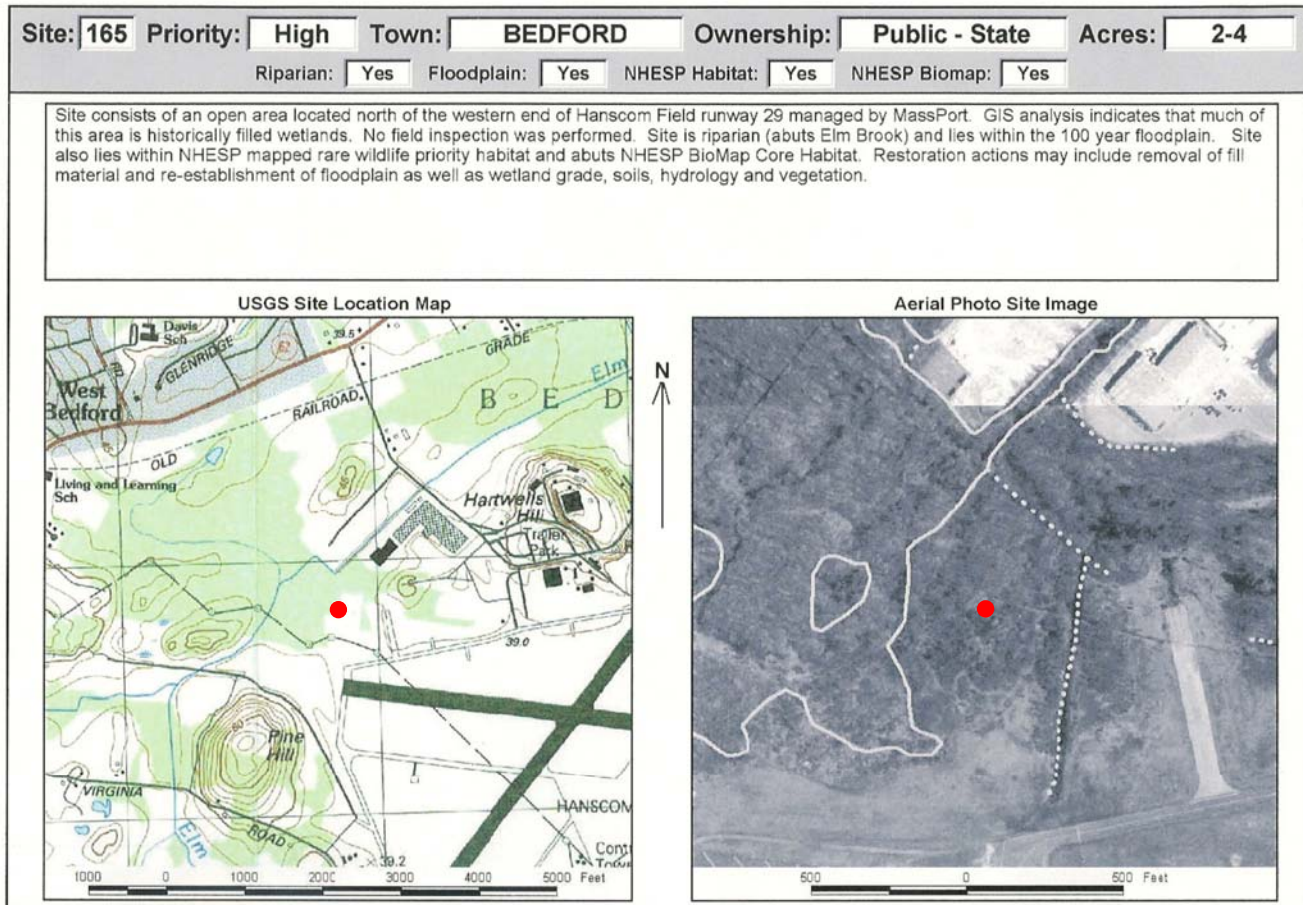
In addition to the public interest review and other evaluation factors set forth in the COE regulations at 33 CFR 320.4, permit decisions issued by the COE also are based upon the U.S. Environmental Protection Agency (EPA) *Section 404(b)(1) Guidelines* (40 CFR 230). At 40 CFR 230.10(a), the *Guidelines* state that:

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<sup>3</sup> Durey, Hunt. May 2002. *Final Shawsheen River Watershed Wetlands Restoration Plan*. MA Wetlands Restoration Program. Boston, MA.

FIGURE 2-1

## POTENTIAL WETLAND RESTORATION SITE NORTH OF RUNWAY 11 END



SOURCE: MA WETLANDS RESTORATION PROGRAM (MAY 2002)



**FIGURE 2-2**

**POTENTIAL WETLAND ESTABLISHMENT/CREATION SITE EAST OF RUNWAY  
23 END SAFETY AREA**

USGS Site Location Map



*Approximate Scale: 1"=2200'*

Aerial Photo Site Location Map



*Approximate Scale: 1"=2200'*

**SOURCE: MAPTECH TERRAIN NAVIGATOR PRO SOFTWARE**

... no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences.

The *Guidelines* further state that:

Where the activity associated with a discharge which is proposed for a special aquatic site [e.g., wetlands] does not require access or proximity to or siting within the special aquatic site in question to fulfill its basic purpose (i.e. is not “water dependent”), practicable alternatives that do not involve special aquatic sites are presumed to be available, unless clearly demonstrated otherwise [40 CFR 230.10(a)(3)].

In accordance with the *Guidelines*, proposed safety area improvements at the Runway 23 End are not water dependent. However, there are no other available practicable alternatives that would have less adverse impact on the aquatic ecosystem in light of the project purpose. In this regard, the *L. G. Hanscom Field Runway 5-23 Safety Area Supplementary Feasibility Analysis* evaluated several alternative scenarios and concluded that “Based on the information presented in this report, Alternative 4 (Improve Existing) is the preferred alternative for Runway End 23.”<sup>4</sup>

This recommended alternative subsequently was adopted by the FAA and constitutes the proposed safety area improvements as set forth in this ENF. In summary, the proposed safety area improvements represent the most practicable alternative design in order to meet the objectives of the project.

As noted previously, a variety of measures also will be implemented to avoid and minimize impacts to wetland resources in accordance with Federal regulatory requirements. The incorporation of these measures into safety area design, construction and operation will yield the Least Environmentally Damaging Practicable Alternative (LEDPA) in light of the project purpose. Regardless, unavoidable wetland impacts will remain following the implementation of avoidance/minimization measures. Accordingly, sites suitable for wetland restoration/creation will be sought, with the identification, screening and selection of potential wetland compensation sites to be conducted in accordance with Federal regulatory and guidance materials.

Following the procedures set forth in these documents, wetland restoration and/or creation sites will be selected to compensate for unavoidable project-related impacts to wetlands. It is anticipated that the use of the selected sites will be confirmed by COE, DEP and the BCC during the EIR process. The provision of at least a one-to-one replacement of affected wetland functions/values, as well as affected wetland acreage, will constitute the primary goal/objective of the overall wetland compensation plan.

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<sup>4</sup> The Louis Berger Group, Inc. and HNTB Corporation. March 2001. *L. G. Hanscom Field Runway 5-23 Safety Area Supplementary Feasibility Analysis*. Prepared for the MA Port Authority. East Boston, MA.

By adhering to the above-referenced procedures, it is expected that the proposed Safety Area Improvements Project at the Runway 23 End will comply with applicable Federal regulatory requirements.

### **2.5.2 MA Wetlands Protection Act/Regulations**

Project-related impacts to bordering vegetated wetlands exceed the 5,000 SF BVW threshold set forth in the MA Wetlands Protection Act regulations. Accordingly, a Variance from 310 CMR 10.55(4)(b) of the regulations, issued by the DEP Commissioner, will be required.

Under the WPA regulations at 310 CMR 10.05(10), the Commissioner may waive the application of any regulation(s) in 310 CMR 10.21 through 10.60 when he finds, after opportunity for an adjudicatory hearing, that:

1. There are no reasonable conditions or alternatives that would allow the project to proceed in compliance with 310 CMR 10.21 through 10.60;
2. Mitigating measures are proposed that will allow the project to be conditioned so as to contribute to the protection of the interests identified in M.G.L. c. 131, § 40; and
3. The variance is necessary to accommodate an overriding community, regional, state or national public interest; or that it is necessary to avoid an Order that so restricts the use of property as to constitute an unconstitutional taking without compensation.

Besides the proposed Runway 23 End safety area improvements, there are no other reasonable conditions or alternatives that would allow the project to proceed in compliance with the MA Wetlands Protection Act regulations. The No-Build Alternative is not consistent with the project purpose, which is to improve safety by bringing the existing Runway 5-23 safety areas closer to compliance with Federal Aviation Administration (FAA) standards, as required by FAA. Additionally, the implementation of another alternative would not be consistent with the above-referenced *L. G. Hanscom Field Runway 5-23 Safety Area Supplementary Feasibility Analysis*, which recommended implementation of the proposed improvements. As stated in the previous section, the proposed safety area improvements represent the most reasonable alternative design in order to meet the objectives of the project.

Proposed safety area improvements will affect approximately 410 linear feet (LF) of banks, 875 SF of land under water, and 91,538 SF (2.10 acres) of bordering vegetated wetlands, the majority of which are associated with Wetland A. A comprehensive wetland compensation plan will be implemented to fully mitigate these impacts. The goal/objective of the wetland compensation plan will be the provision of at least a one-to-one replacement of affected State-listed statutory interests, as well as affected wetland acreage. Consequently, besides vegetated wetlands, potential wetland restoration and creation sites will be investigated for their potential to support waterways and associated bank resources. As described in previous sections, the MA Wetlands Protection Act regulations and the *MA Inland Wetland Replication Guidelines* will guide the wetland compensation planning and design process. Collectively, the incorporation of wetland

impact avoidance/minimization and wetland compensation measures will allow the project to be conditioned so as to contribute to the protection of the interests identified in the MA Wetlands Protection Act.

To comply with the final Variance criterion, it must be demonstrated that the Variance is necessary to accommodate an overriding community, regional, state or national public interest. As stated in the DEP *Decision on Request for Variance* associated with the Massport Safety Improvement Project for Runway End 22L at Logan International Airport, issued by Commissioner Daniel Greenbaum on May 4, 1993:

This third variance criteria requires a showing that the project is being pursued by, or under the auspices of, a public authority or a private entity found to be serving a public function. Since this project is being pursued by Massport, the first element of this test is met in that the applicant is a public authority. Chapter 456 of the Acts and Resolves of 1956 established Massport as a public instrumentality for the performance of an essential government function.

The second element of this test requires that the applicant show that the project is one of such unusual merit or necessity in serving a public interest that it overrides the Department's interest in enforcing its wetland regulations. (See Shawmut Avenue Landfill Closure, supra.). The public interest to be served by the project is that of improving the degree of safety at the end of Runway 22L at Logan Airport. Existing conditions at the airport runway-end do not comply with recommended aeronautical safety standards and would inhibit efficient rescue operations.

With respect to the Massport Safety Improvement Project for Runway End 22L at Logan, Commissioner Greenbaum further noted that:

In sum, I find that the applicant has established that the proposed project will promote an overriding public interest. The ISA [Inclined Safety Area] at Runway 22-L will improve airport operations in the event of an aircraft accident, will help minimize aircraft damage in the event of an overrun/undershoot, and result in enhanced survivability from such accidents.

Similarly, with respect to proposed improvements to non-standard runway safety areas (RSA) at Norwood Memorial Airport, the *Decision on Request for Variance* issued by DEP Commissioner Lauren Liss on December 22, 2000 concluded that:

...improvements to RSA's represent an important feature at the airport to improve public safety. Therefore, I find that the project is one of an overriding public interest that will improve safety at the airport.

Each of the above-referenced findings is applicable to proposed safety area improvements associated with the Runway 23 End at Hanscom Field. As a public authority, Massport serves a

public function. Secondly, proposed safety area improvements at the Runway 5/23 Ends will bring these non-standard surfaces closer to compliance with current FAA standards, as set forth in FAA Advisory Circular 150/5300-13 (Airport Design). Therefore, the public interest to be served by these actions is that of improving the degree of safety at the end of Runways 5/23 at Hanscom Field. Additionally, project implementation will enhance public safety and survivability in the event of an aircraft accident or an overrun/undershoot. Accordingly, the proposed project is one of such unusual merit or necessity in serving a public interest that it overrides the Department's interest in enforcing its wetland regulations.

In light of the above, it is anticipated that the DEP Commissioner will find that the proposed safety area improvements at the Runway 23 End meet the MA Wetlands Protection Act Variance criteria, and can be conditioned so as to contribute to the protection of the interests and standards set forth in the State wetland regulations.